

## EFFICIENT INFORMATION MANAGEMENT IN TECHNICAL EDUCATION SYSTEM SUPPLY CHAIN USING DATA INTEGRATION SYSTEM (DIS)

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### ABSTRACT

*For today's education systems' success, effective policy-making and system monitoring through data and information are essential. Using education management information systems (EMIS), many countries all over the world got involved in collecting, processing, and managing more and better data. However, design and development of EMIS focused on information technology enhancements, and/ or data storage and maintenance, with scarce concentration on the management context in which EMIS operates and data utilization for policy decisions. This paper reviews the technical, organizational, and institutional conditions required to enable information-based decision-making for effective system management. Demand creation for information and the nurturing of a culture of open communication, information sharing, and information use along with technical capacity building. The purpose of this study to determine the various functional areas for deploying EMIS for information governance in higher education institutions.*

**KEYWORDS:** Education Management Information Systems (EMIS), General Administration, Information Administration, Student Administration, Staff Administration & Data Integration System (DIS).

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### INTRODUCTION

Upgrading and refining of cultural, social and economic development in our societies are achieved by education, thereby favoring individuals with the ways to enhance their health, skills, knowledge, and capacity for productive work. There are evidences that education plays an important factor in the growth and development of an individual. These days maximizing student learning with limited resources is the biggest educational challenge. By collecting and examining data and information in educational decision-making can ensure a constant monitoring and evaluation of the learning system.

In the education system management, the goal of information-based decision-making is increased access, efficiency, effectiveness, equity, and quality of education through effective systems of monitoring and evaluation, budgeting and planning, policy research and analysis. By ensuring necessary data and information and fostering an atmosphere the necessity for this information drives the use of education management information systems (EMIS). At the core of EMIS development is the integrated data and information systems supporting the educational management functions in the education system.

### Managing Education System Data & Information (EMIS Development Framework)

“Perhaps for the first time in history, humankind has the capacity to create far more information than anyone can absorb, to foster greater interdependency than anyone can manage, and to accelerate change faster than anyone’s ability to keep pace” (Peter Senge 1990). The wealth of information in the education system is addressed by an EMIS that is used to legislate meaningful changes in education while emphasizing the interdependencies of different components of the education system as well as between education and other aspects of society.

### Definition of EMIS

An EMIS is an institutional service unit producing, managing, and disseminating educational data and information, usually within a national ministry or department of education. Apart from these, the other management functions of EMIS are collecting, storing, integrating, processing, organizing, outputting, and marketing educational data and statistics in a timely and trust worthy manner, serving the requirements of educational management, resource allocation, and policy formulation, such as planning and budgeting, policy research and analysis, monitoring and evaluation, allocating school supplies, and domestic and global communication and collaboration.

### Supply Chain

All activities starting from the suppliers to the end customers comprise a network of business or technical institutes called supply chain. This network of connected and interdependent organizations work together to control, manage, improve the flow of materials and information from suppliers (upstream) to customers (downstream), that is, industries (end customers) Supply chain includes all stages needed in meeting a customer request [1] (Fig 1.1).

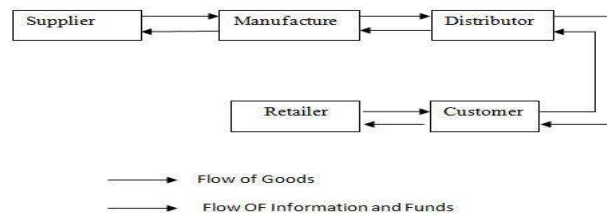


Figure 1.1: Supply Chain

### Importance of Information Supply Chain

These days in business information is the key to decision making. Because these paper-based transactions and communications were slow, unreliable, and error-prone, it is costly to run businesses in this manner. This decreased the firms' effectiveness to design, develop, procure, manufacture, and distribute their products. In 1980s, information was often overlooked as a critical competitive resource because its value to supply chain members was not clearly understood.

- A corporate obsession was to satisfy customers.
- It is critical to serving the customer in the best fashion, and information on order status, product availability, delivery schedules, and invoices are essential for total customer service experience.
- To reduce inventory and human resource needs to a competitive level, information is considered crucial in the managers' abilities.
- In the strategic planning for and deployment of resources, information flow plays a chief role.

### **Automatic Information Management System**

Distinct information-handling assignment such as communication, computation, dissemination, processing, and storage of information are executed by computer hardware, software, firmware, or any combination of these called an automated information management system (AIMS). This requires computers, word processing systems, networks, or other electronic information handling systems, and associated equipment. An excellent example of automated information management systems is the management information systems. [2]

Focusing mainly on improving business operations, many researchers developed the SCM, without realizing (especially academic researchers) that academic supply chain management research can be conducted for their own educational institutions (Fig 1.2).



**Figure 1.2: Holistic View of Educational Supply Chain**

### **PROBLEM IDENTIFICATION**

By applying automatic information management system in technical education supply chain of technical Institutions, the researchers aim the following:

- According to the existing system study, all the data were stored manually on registers, making the task very tiring and prone to error.
- In the existing system, searching and report generation is not feasible.
- Since the existing system is employee-dependent, leading to issues in maintaining, updating and retrieving selected information in the absence of an employee.
- In a conventional institution, data management with regard to admission, re-admission, viewing student detail, fee payment, report generation and so on is a challenge.
- Various academic tasks, namely, admission process, fee receiving, preparing admission report, fee report and others require the deployment of huge manpower.
- Data retrieval becomes time-consuming and tiresome.
- The concept of paper-free environment makes storing older data difficult.
- Duplication results in manual preparation of receipts.
- Huge file maintenance.
- Non-centralized data.

Therefore, automatic information management in technical education supply chain has become a scope for improvement.

## OBJECTIVES

- To study and analyze the current information management system in technical education supply chain.
- To understand the current information management system's demerits.
- Deploying automatic information management system in technical institution supply chain to overcome the demerits of the current system.

## LITERATURE SURVEY

Literature review has revealed the need for IT-based effective automatic information management system in technical education supply chain to enhance the complex supply chains' performance.

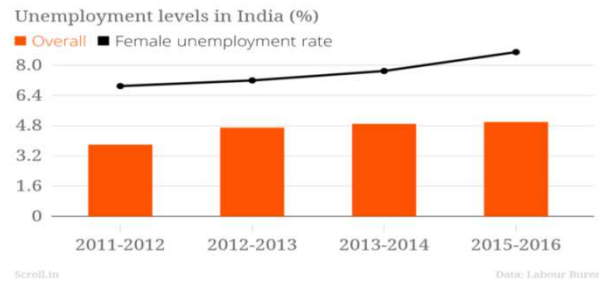
Dr. K. Venkata Subbiahet al in his study developed a portal to capture data such as mid-marks, semester grades, CGPA, SGPA, personal data, attendance and faculty data, which was programmed using simple and livid codes and the database could be accessed with oracle 12c database, SQL developer. Through Apache tomcat 8.0 with server port 8015 and connector port 8020, this portal was embedded with the local server, enabling the intranet portal, and HTML language was used. The web pages were built using java scripts and CSS. This portal completely rules out the paper work, avoiding data loss and data redundancy and helping its users to access, manage and update his/her data effectively and efficiently. The portal has a centralized facility to be modified and quickly shared among multiple users. Because of its web-based front end, the portal enables the user to use a database directly, eliminating the necessity to understand. Through an internet connection and a basic web browser, this portal can be connected from anywhere. This portal enables conducting various online surveys.

Dr. Darwin [4] called the output of supply chain management model as productivity and advancement of graduates through unified and innovative outputs – instruction, research and extension or PAGUIO-INREX Model. This model emphasizes the role of the trifocalzed function in higher education with regard to the formation of productive and competent graduates of Teacher Education Institution. With regard to relevance, responsiveness and effectiveness in attaining the quality educational programs and services, the PAGUIO-INREX Model is considered a fundamental concept of reference in the development of graduates and is also in line with the drive of Philippine Education.

According to Samar Alzamel [5], it is essential to understand the factors impacting student contentment with educational programs in the University of Dayton, and how those factors affect student motivation, admissions, retention and performances. In addition, student and quality are considered chief to the doctrine of the higher education supply chain system, which continues with the commitment of a refreshed foreseeable prosperity for the higher education.

### Importance of Technical Education in India

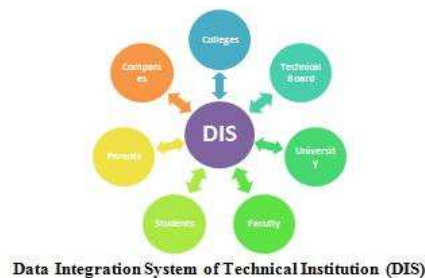
Even today the field of engineering conquers, with roughly 15 lakhs seats across 36 disciplines in 3393 engineering colleges in India, which are approved by the AICTE [6]. In India, technical education pitches into the overall education system and plays an important role in the social and economic development of our nation. Enhancing the job opportunity, it is most sought after course. In India, technical education in specialized areas is transfused at various levels of degree, diploma, post graduation and research, thereby catering to the various technological development and economic progress. Over the years, the input volume of institutions providing technical education escalated multifarious.



**Figure 4.1: The Unemployment Rate of Professionals**

### **Literature Review of Techno Educational Supply Chain Management**

The major components of ITEM (Integrated Tertiary Educational Supply Chain Management) encompass education supply chain, research supply chain and educational management. Four main activities include education development, education assessment, research development, and research assessment in four aspects, namely, programs establishment, university culture, faculty capabilities, and facilities were investigated.



**Figure 4.2**

### **METHODOLOGY AND ADVANTAGES OF AUTOMATIC INFORMATION MANAGEMENT SYSTEM IN TECHNICAL INSTITUTION**

Considering as one of the important functional areas in technical education, information administration is often referred to as managerial in various studies. To enhance the overall environment and operational efficiency of technical institutions and its functional areas, the usage of automatic information management system will be helpful.

#### **The Methodology Adopted are as Follows**

- Item generation
- Content validity
- Reliability test
- Criterion validity
- Path validity

### **Study of Existing Information Management System in Technical Institution Supply Chain**

The current manner of manual data storage is proving to be tedious, time-consuming and error prone. It is employee dependent and hence causing issues in maintaining, updating and retrieving selected information.

### Disadvantages of Existing System

- Demand for huge manpower for various tasks such as admission process, fee receiving, preparing admission report, fee report, and others
- Time-consuming for retrieving data.
- To achieve paper-free environment, storing older data is considered difficult. Manual receipt preparation may involve duplications.
- Marinating huge files.

### Advantages of Automatic Information Management System in the Technical Institution

- Eliminates paperwork
- Economic and saves time
- It provides the platform to break the communication barrier between students and their parents.
- Makes easy to get study, conduct, completion and transfer certificates
- Continuous monitoring of student attendance
- Automatic evaluation of student marks in their inter assessment marks
- Communication with PUC/diploma or alumni via SMS
- Good communication achieved
- Accuracy and reliability of system achieved
- Overall institution quality attained

### CONCLUSIONS

With effective implementation of supply chain management, technical institutions are seen as industries for producing technical manpower and hence should have the prime objective to produce highly skilled technical graduates to the customers (students) and stakeholders' high satisfaction at low operational cost. A proper IT strategy integrated with a supply chain strategy can change the fortune of an education institute. Leveraging IT tools to address business concerns is the current requirement of organizations to move towards integrated supply chains.

Technical institutions should develop a strong and effective supply chain network by implementing the best supply chain management tools to provide high-quality and cost-effective technical education.

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